

Cooper Lighting Solutions Photometric Lab  
1121 Highway 74 South  
Peachtree City, GA 30269



Scaled data based on original data using  
LM-79-2019 Approved Method: Electrical and Photometric Measurements of Solid-  
State Lighting Products

Test Report Prepared for  
Cooper Lighting Solutions

Brand: NEO-RAY

Report Number: P923183

Luminaire Tested: DFN2DIP-SQ4F0-100D070US940-RLLONL

Issue Date: 11/21/2024

**Test Information**

Test Method: LM-79-2019  
Report Number: P923183  
REPORT IS A COMBINATION OF REPORTS P901606 AND P898471  
Test Lab: INNOVATION CENTER  
Issue Date: 11/21/2024  
Manufacturer: COOPER LIGHTING SOLUTIONS  
Product Line: NEO-RAY  
Catalog Number: DFN2DIP-SQ4F0-100D070US940-RLLONL  
Description: 4 foot, Square Define Geo, with Direct 1in Regressed Frosted Lens, Indirect Open No Lens  
Light Source: -  
Ballast/Driver: -

**Summary**

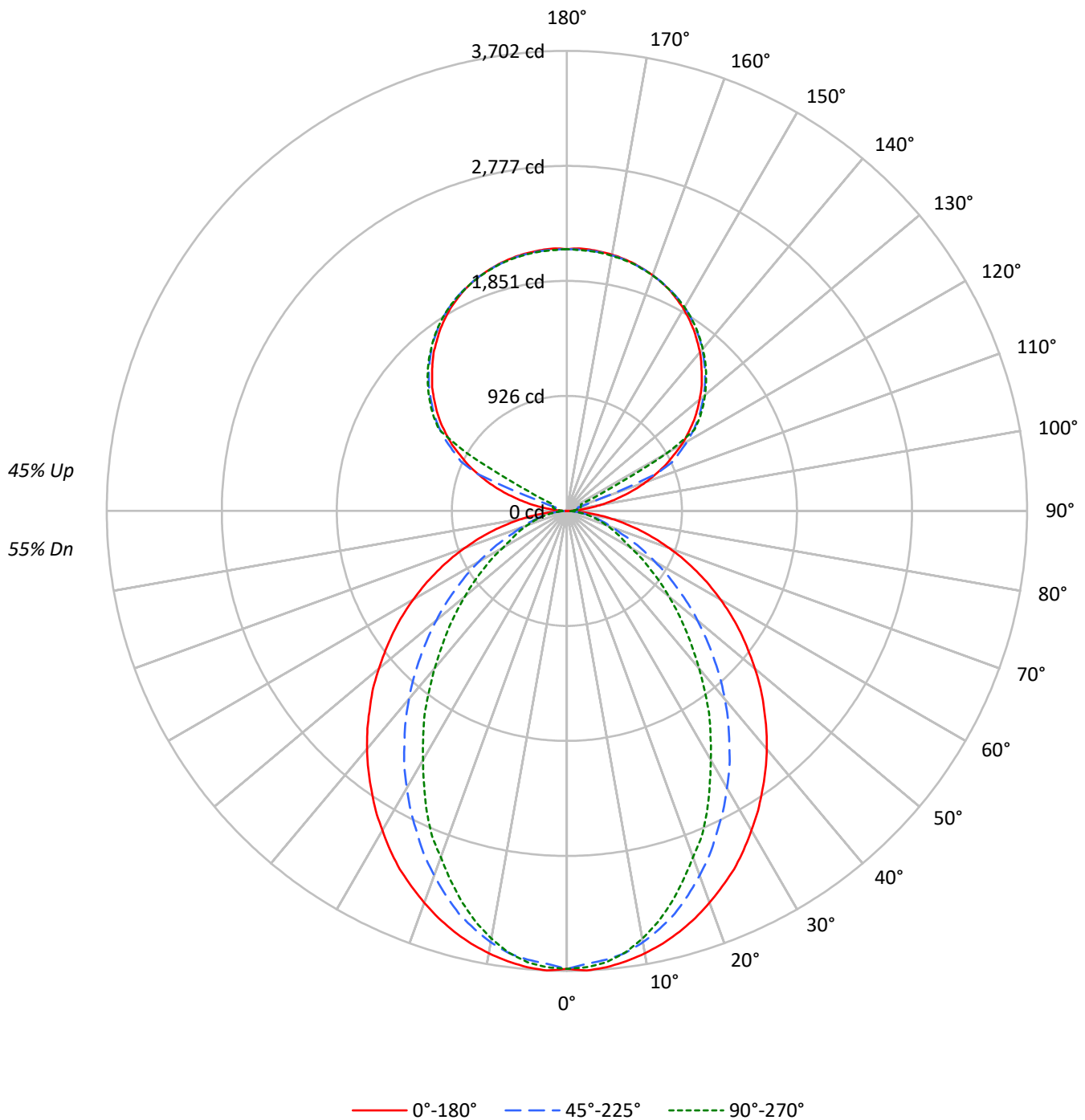
Lumens per Lamp: N/A  
Luminaire Lumens: 13759.1 lumens  
Efficiency: N/A  
Efficacy: 95.0 lumens/watt  
Spacing Criteria (0/90/45): 1.2 / 0.99 / 1.16  
Luminous Opening: Rectangular w/ Sides (W: 3.92' x L: 3.92' x H: 0.1')  
CIE Type: General Diffuse

Input Watts (W): 144.9  
Input Voltage (V):  
Input Current (Ain): NR  
Voltage Rise (V): NR  
Power Factor: 0.9968  
Total Harmonic Distortion (THDi): 0.064  
Frequency (hertz): 60  
Stabilization Time: NR  
Operation Time: NR  
Ambient Temperature (°C): NR  
Test Distance: 24 FT

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### Luminous Intensity Polar Plot



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**COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:**

|     |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|----|----|----|----|----|
| RF  | 20  |     |     |     | 20  |     |     |     | 20 |    |    |    | 20 |    |    |    | 20 |
| RC  | 80  |     |     |     | 70  |     |     |     | 50 |    |    |    | 30 |    |    |    | 10 |
| RW  | 70  | 50  | 30  | 10  | 70  | 50  | 30  | 10  | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 |
| RCR |     |     |     |     |     |     |     |     |    |    |    |    |    |    |    |    |    |
| 0   | 108 | 108 | 108 | 108 | 101 | 101 | 101 | 101 | 86 | 86 | 86 | 73 | 73 | 73 | 61 | 61 | 61 |
| 1   | 99  | 95  | 92  | 88  | 92  | 89  | 86  | 83  | 76 | 74 | 72 | 65 | 63 | 62 | 55 | 53 | 52 |
| 2   | 91  | 84  | 78  | 73  | 84  | 78  | 73  | 69  | 68 | 64 | 60 | 58 | 55 | 52 | 49 | 47 | 45 |
| 3   | 83  | 74  | 67  | 61  | 77  | 69  | 63  | 58  | 60 | 55 | 51 | 52 | 48 | 45 | 44 | 41 | 39 |
| 4   | 77  | 66  | 58  | 52  | 71  | 62  | 55  | 50  | 54 | 48 | 44 | 46 | 42 | 39 | 39 | 36 | 34 |
| 5   | 70  | 59  | 51  | 45  | 65  | 55  | 48  | 43  | 48 | 43 | 39 | 42 | 38 | 34 | 36 | 33 | 30 |
| 6   | 65  | 53  | 45  | 40  | 60  | 50  | 43  | 38  | 44 | 38 | 34 | 38 | 34 | 30 | 33 | 29 | 27 |
| 7   | 60  | 48  | 41  | 35  | 56  | 45  | 38  | 33  | 40 | 34 | 30 | 35 | 30 | 27 | 30 | 27 | 24 |
| 8   | 56  | 44  | 36  | 31  | 52  | 41  | 35  | 30  | 37 | 31 | 27 | 32 | 28 | 24 | 28 | 24 | 22 |
| 9   | 52  | 40  | 33  | 28  | 49  | 38  | 31  | 27  | 34 | 28 | 24 | 29 | 25 | 22 | 26 | 22 | 20 |
| 10  | 49  | 37  | 30  | 25  | 46  | 35  | 29  | 24  | 31 | 26 | 22 | 27 | 23 | 20 | 24 | 20 | 18 |

**AVERAGE LUMINANCE (cd/sqm):**

|     | 0°   | 45°  | 90°  |
|-----|------|------|------|
| 0°  | 2586 | 2586 | 2586 |
| 5°  | 2590 | 2545 | 2562 |
| 10° | 2564 | 2496 | 2479 |
| 15° | 2529 | 2414 | 2351 |
| 20° | 2482 | 2301 | 2194 |
| 25° | 2434 | 2174 | 2041 |
| 30° | 2370 | 2043 | 1848 |
| 35° | 2307 | 1903 | 1678 |
| 40° | 2243 | 1758 | 1484 |
| 45° | 2169 | 1597 | 1307 |
| 50° | 2092 | 1435 | 1134 |
| 55° | 2011 | 1261 | 969  |
| 60° | 1918 | 1079 | 798  |
| 65° | 1811 | 894  | 719  |
| 70° | 1682 | 722  | 652  |
| 75° | 1519 | 637  | 595  |
| 80° | 1283 | 537  | 519  |
| 85° | 893  | 361  | 394  |

**MAXIMUM LUMINANCE 45°-90°:**

Horizontal Angle: 0°  
Vertical Angle: 45°  
Luminance: 2169 cd/sqm

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**ZONAL LUMENS:**

| Zone      | Lumens  | % Fixture |
|-----------|---------|-----------|
| 0°-10°    | 345.4   | 2.5       |
| 10°-20°   | 948.2   | 6.9       |
| 20°-30°   | 1331.2  | 9.7       |
| 30°-40°   | 1451.1  | 10.5      |
| 40°-50°   | 1333.8  | 9.7       |
| 50°-60°   | 1047.4  | 7.6       |
| 60°-70°   | 681.8   | 5.0       |
| 70°-80°   | 351.0   | 2.6       |
| 80°-90°   | 93.3    | 0.7       |
| 90°-100°  | 69.5    | 0.5       |
| 100°-110° | 259.0   | 1.9       |
| 110°-120° | 686.8   | 5.0       |
| 120°-130° | 1139.1  | 8.3       |
| 130°-140° | 1209.9  | 8.8       |
| 140°-150° | 1124.5  | 8.2       |
| 150°-160° | 904.1   | 6.6       |
| 160°-170° | 582.6   | 4.2       |
| 170°-180° | 200.5   | 1.5       |
| 0°-30°    | 2624.8  | 19.1      |
| 0°-40°    | 4076.0  | 29.6      |
| 0°-60°    | 6457.2  | 46.9      |
| 0°-90°    | 7583.2  | 55.1      |
| 90°-120°  | 1015.2  | 7.4       |
| 90°-150°  | 4488.7  | 32.6      |
| 90°-180°  | 6176.0  | 44.9      |
| 0°-180°   | 13759.1 | 100.0     |

**CANDELA DISTRIBUTION:**

|      | 0°   | 22.5° | 45°  | 67.5° | 90°  | Flux |
|------|------|-------|------|-------|------|------|
| 0°   | 3685 | 3685  | 3685 | 3685  | 3685 |      |
| 5°   | 3685 | 3669  | 3625 | 3655  | 3645 | 349  |
| 15°  | 3505 | 3468  | 3355 | 3292  | 3259 | 988  |
| 25°  | 3182 | 3075  | 2855 | 2718  | 2668 | 1463 |
| 35°  | 2742 | 2572  | 2278 | 2068  | 1994 | 1716 |
| 45°  | 2241 | 2018  | 1668 | 1431  | 1351 | 1731 |
| 55°  | 1704 | 1444  | 1084 | 884   | 821  | 1523 |
| 65°  | 1151 | 880   | 580  | 467   | 457  | 1141 |
| 75°  | 614  | 380   | 267  | 243   | 240  | 649  |
| 85°  | 143  | 73    | 63   | 63    | 63   | 164  |
| 90°  | 1    | 18    | 30   | 38    | 41   | 13   |
| 95°  | 99   | 49    | 59   | 67    | 66   | 117  |
| 105° | 463  | 509   | 93   | 110   | 116  | 495  |
| 115° | 876  | 902   | 940  | 235   | 125  | 863  |
| 125° | 1239 | 1259  | 1288 | 1299  | 1303 | 1105 |
| 135° | 1534 | 1558  | 1572 | 1587  | 1584 | 1185 |
| 145° | 1779 | 1777  | 1803 | 1814  | 1806 | 1113 |
| 155° | 1959 | 1945  | 1963 | 1972  | 1960 | 903  |
| 165° | 2064 | 2055  | 2059 | 2070  | 2059 | 583  |
| 175° | 2111 | 2100  | 2104 | 2114  | 2099 | 201  |
| 180° | 2107 | 2107  | 2107 | 2107  | 2107 |      |

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**CANDELA DISTRIBUTION (FULL):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 0°     | 3685.4 | 3685.4 | 3685.4 | 3685.4 | 3685.4 |
| 2.5°   | 3702.0 | 3685.4 | 3648.6 | 3682.2 | 3675.5 |
| 5°     | 3685.4 | 3668.8 | 3625.2 | 3655.4 | 3645.4 |
| 7.5°   | 3655.4 | 3635.5 | 3588.8 | 3601.9 | 3585.3 |
| 10°    | 3615.4 | 3592.0 | 3525.5 | 3515.2 | 3495.4 |
| 12.5°  | 3565.5 | 3535.4 | 3445.1 | 3425.3 | 3388.5 |
| 15°    | 3505.3 | 3468.5 | 3355.2 | 3291.9 | 3258.7 |
| 17.5°  | 3435.2 | 3381.8 | 3241.7 | 3168.4 | 3115.0 |
| 20°    | 3355.2 | 3288.4 | 3121.7 | 3038.6 | 2964.9 |
| 22.5°  | 3268.6 | 3191.8 | 2998.2 | 2885.0 | 2835.1 |
| 25°    | 3181.9 | 3075.1 | 2854.9 | 2718.3 | 2668.1 |
| 27.5°  | 3078.5 | 2964.9 | 2721.5 | 2564.7 | 2488.0 |
| 30°    | 2968.5 | 2841.4 | 2574.6 | 2404.9 | 2314.6 |
| 32.5°  | 2861.7 | 2708.0 | 2434.9 | 2234.6 | 2151.1 |
| 35°    | 2741.7 | 2571.5 | 2278.1 | 2068.0 | 1994.3 |
| 37.5°  | 2624.9 | 2441.2 | 2131.3 | 1900.9 | 1817.8 |
| 40°    | 2501.4 | 2301.5 | 1977.7 | 1741.0 | 1654.3 |
| 42.5°  | 2374.7 | 2161.3 | 1824.5 | 1577.5 | 1494.3 |
| 45°    | 2241.3 | 2017.7 | 1667.8 | 1430.7 | 1350.7 |
| 47.5°  | 2114.7 | 1877.9 | 1517.7 | 1280.6 | 1207.4 |
| 50°    | 1974.5 | 1737.8 | 1370.8 | 1140.5 | 1070.8 |
| 52.5°  | 1837.5 | 1587.4 | 1230.7 | 1010.6 | 947.3  |
| 55°    | 1704.1 | 1444.1 | 1083.9 | 884.0  | 820.6  |
| 57.5°  | 1567.6 | 1300.7 | 954.0  | 767.1  | 713.7  |
| 60°    | 1427.4 | 1160.7 | 817.1  | 647.2  | 593.8  |
| 62.5°  | 1290.8 | 1024.0 | 700.3  | 540.4  | 513.8  |
| 65°    | 1150.8 | 880.4  | 580.3  | 467.1  | 456.8  |
| 67.5°  | 1017.4 | 747.0  | 467.1  | 410.1  | 400.2  |
| 70°    | 877.2  | 617.2  | 386.7  | 353.5  | 340.1  |
| 72.5°  | 743.8  | 496.8  | 323.4  | 296.9  | 290.2  |
| 75°    | 613.6  | 380.0  | 266.8  | 243.4  | 240.2  |
| 77.5°  | 483.8  | 270.0  | 210.2  | 196.7  | 190.0  |
| 80°    | 363.4  | 193.6  | 160.0  | 146.9  | 146.9  |
| 82.5°  | 253.3  | 130.2  | 110.0  | 103.3  | 103.3  |
| 85°    | 143.3  | 73.2   | 63.3   | 63.3   | 63.3   |
| 87.5°  | 53.4   | 26.6   | 26.6   | 23.4   | 23.4   |
| 90°    | 1.4    | 18.3   | 30.4   | 38.2   | 41.1   |
| 92.5°  | 38.2   | 32.0   | 36.6   | 39.7   | 41.1   |
| 95°    | 99.0   | 48.7   | 59.4   | 67.1   | 65.5   |
| 97.5°  | 178.3  | 53.4   | 77.7   | 82.4   | 83.8   |
| 100°   | 269.9  | 61.0   | 86.9   | 99.0   | 102.1  |
| 102.5° | 370.3  | 367.5  | 90.0   | 106.6  | 111.3  |
| 105°   | 463.4  | 509.2  | 93.0   | 109.7  | 115.8  |
| 107.5° | 571.6  | 609.7  | 96.1   | 112.8  | 119.0  |
| 110°   | 675.4  | 707.2  | 266.8  | 114.4  | 120.4  |

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**CANDELA DISTRIBUTION (continued):**

|        | 0°     | 22.5°  | 45°    | 67.5°  | 90°    |
|--------|--------|--------|--------|--------|--------|
| 112.5° | 772.9  | 800.2  | 774.4  | 117.3  | 122.0  |
| 115°   | 876.5  | 902.3  | 940.5  | 234.8  | 125.1  |
| 117.5° | 966.4  | 996.8  | 1022.9 | 804.8  | 405.5  |
| 120°   | 1067.0 | 1089.8 | 1117.4 | 1135.7 | 929.9  |
| 122.5° | 1152.3 | 1176.7 | 1207.4 | 1216.4 | 1218.0 |
| 125°   | 1239.2 | 1259.1 | 1288.1 | 1298.8 | 1303.2 |
| 127.5° | 1318.5 | 1339.8 | 1362.8 | 1378.0 | 1379.5 |
| 130°   | 1393.2 | 1417.6 | 1434.3 | 1451.2 | 1449.7 |
| 132.5° | 1469.4 | 1489.3 | 1506.0 | 1519.7 | 1518.3 |
| 135°   | 1533.5 | 1557.9 | 1571.6 | 1586.9 | 1583.9 |
| 137.5° | 1600.4 | 1618.8 | 1634.1 | 1649.4 | 1644.8 |
| 140°   | 1666.0 | 1678.3 | 1695.0 | 1708.7 | 1701.1 |
| 142.5° | 1721.0 | 1731.7 | 1751.4 | 1763.5 | 1756.0 |
| 145°   | 1779.0 | 1777.4 | 1803.2 | 1813.9 | 1806.3 |
| 147.5° | 1829.1 | 1824.6 | 1850.5 | 1858.1 | 1852.1 |
| 150°   | 1877.9 | 1867.3 | 1891.8 | 1900.8 | 1893.2 |
| 152.5° | 1919.0 | 1906.9 | 1929.8 | 1938.9 | 1928.3 |
| 155°   | 1958.7 | 1945.1 | 1963.4 | 1972.5 | 1960.3 |
| 157.5° | 1990.7 | 1978.6 | 1992.3 | 2003.0 | 1990.7 |
| 160°   | 2018.3 | 2009.0 | 2018.3 | 2027.3 | 2016.6 |
| 162.5° | 2042.6 | 2033.5 | 2041.0 | 2051.7 | 2038.0 |
| 165°   | 2063.9 | 2054.9 | 2059.3 | 2070.0 | 2059.3 |
| 167.5° | 2080.7 | 2071.4 | 2076.2 | 2086.9 | 2073.1 |
| 170°   | 2094.4 | 2085.3 | 2088.3 | 2099.0 | 2085.3 |
| 172.5° | 2103.5 | 2094.4 | 2097.6 | 2108.2 | 2094.4 |
| 175°   | 2111.1 | 2100.4 | 2103.5 | 2114.2 | 2099.0 |
| 177.5° | 2114.2 | 2103.5 | 2105.1 | 2115.9 | 2102.0 |
| 180°   | 2106.6 | 2106.6 | 2106.6 | 2106.6 | 2106.6 |

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**CIE UGR TABLE:**

| Reflectances:   |      |                  |       |       |       |       |                |       |       |       |       |
|-----------------|------|------------------|-------|-------|-------|-------|----------------|-------|-------|-------|-------|
| Ceiling         |      | 0.7              | 0.7   | 0.5   | 0.5   | 0.3   | 0.7            | 0.7   | 0.5   | 0.5   | 0.3   |
| Wall            |      | 0.5              | 0.3   | 0.5   | 0.3   | 0.3   | 0.5            | 0.3   | 0.5   | 0.3   | 0.3   |
| Reference plane |      | 0.2              | 0.2   | 0.2   | 0.2   | 0.2   | 0.2            | 0.2   | 0.2   | 0.2   | 0.2   |
| Room dimensions |      | Viewed crosswise |       |       |       |       | Viewed endwise |       |       |       |       |
| X=2H            | Y=2H | 10.93            | 11.80 | 11.84 | 12.73 | 13.93 | 6.89           | 7.76  | 7.80  | 8.69  | 9.89  |
|                 | 3H   | 12.61            | 13.39 | 13.54 | 14.33 | 15.56 | 8.08           | 8.86  | 9.01  | 9.80  | 11.03 |
|                 | 4H   | 13.22            | 13.96 | 14.17 | 14.91 | 16.14 | 8.53           | 9.27  | 9.48  | 10.22 | 11.45 |
|                 | 6H   | 13.65            | 14.33 | 14.61 | 15.28 | 16.53 | 8.86           | 9.53  | 9.81  | 10.49 | 11.73 |
|                 | 8H   | 13.78            | 14.43 | 14.75 | 15.40 | 16.64 | 8.95           | 9.59  | 9.91  | 10.56 | 11.81 |
|                 | 12H  | 13.85            | 14.46 | 14.82 | 15.42 | 16.69 | 8.99           | 9.61  | 9.96  | 10.57 | 11.84 |
| 4H              | 2H   | 10.95            | 11.69 | 11.90 | 12.63 | 13.87 | 7.49           | 8.23  | 8.44  | 9.17  | 10.41 |
|                 | 3H   | 12.79            | 13.40 | 13.75 | 14.38 | 15.62 | 8.84           | 9.46  | 9.81  | 10.43 | 11.68 |
|                 | 4H   | 13.48            | 14.04 | 14.45 | 15.01 | 16.29 | 9.39           | 9.95  | 10.36 | 10.92 | 12.20 |
|                 | 6H   | 14.01            | 14.49 | 14.99 | 15.48 | 16.75 | 9.82           | 10.30 | 10.80 | 11.29 | 12.56 |
|                 | 8H   | 14.18            | 14.63 | 15.17 | 15.62 | 16.91 | 9.95           | 10.40 | 10.93 | 11.38 | 12.67 |
|                 | 12H  | 14.28            | 14.69 | 15.29 | 15.69 | 16.98 | 10.02          | 10.42 | 11.02 | 11.42 | 12.71 |
| 8H              | 4H   | 13.46            | 13.90 | 14.44 | 14.89 | 16.18 | 9.68           | 10.13 | 10.66 | 11.12 | 12.40 |
|                 | 6H   | 14.03            | 14.40 | 15.04 | 15.43 | 16.71 | 10.20          | 10.57 | 11.21 | 11.60 | 12.88 |
|                 | 8H   | 14.25            | 14.57 | 15.27 | 15.59 | 16.89 | 10.39          | 10.72 | 11.41 | 11.74 | 13.04 |
|                 | 12H  | 14.39            | 14.68 | 15.41 | 15.69 | 17.04 | 10.52          | 10.80 | 11.54 | 11.81 | 13.16 |
| 12H             | 4H   | 13.41            | 13.81 | 14.41 | 14.82 | 16.11 | 9.69           | 10.09 | 10.69 | 11.10 | 12.39 |
|                 | 6H   | 14.00            | 14.33 | 15.02 | 15.35 | 16.65 | 10.25          | 10.58 | 11.27 | 11.60 | 12.90 |
|                 | 8H   | 14.23            | 14.52 | 15.25 | 15.53 | 16.87 | 10.47          | 10.75 | 11.49 | 11.76 | 13.11 |